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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,507	09/25/2006	Minoru Akaishi	052550	4605

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EXAMINER	
KEMMERLE III, RUSSELL J	

ART UNIT	PAPER NUMBER
1791	

NOTIFICATION DATE	DELIVERY MODE
02/22/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentmail@whda.com

Office Action Summary	Application No.	Applicant(s)	
	10/539,507	AKAISHI ET AL.	
	Examiner	Art Unit	
	RUSSELL J. KEMMERLE III	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 November 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 2* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 2* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/2/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

In view of the amendments made to the claims the previous rejection under 35 USC §112, second paragraph, are withdrawn.

In view of the explanations of relevance provided for the cited references that had not been considered in the previous IDS submissions, the IDS submitted 2 November 2009 citing those same references has been considered.

Claim Rejections - 35 USC § 103

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akaishi (M. Akaishi et al., "Synthesis of fine-grained polycrystalline diamond with carbonate as a sintering agent, 41st High Pressure Seminar (2000), The Japan Society of High Pressure Science and Technology, 2D01, p108) in view of Davies (WO 02/09909).

Akaishi discloses a polycrystalline diamond made from a process substantially similar to that of the current invention, with the exception that Akaishi discloses the use of a sintering aid laminated onto the diamond powder before sintering. Specifically, Akaishi discloses enclosing diamond powder having a grain size of 0-0.5 μm (0-500 nm) in a Ta capsule which is then placed in a pressure transmitting medium (such as molten NaCl) and sintered at 7.7 GPa and 2200°C using a modified belt type apparatus (ultrahigh-pressure synthesizing apparatus). Based on the similarities between the

process of the current invention and that of Akaishi it is assumed that the process of Akaishi is carried out at thermodynamically stable conditions.

While Akaishi discloses the use of natural diamond powder instead of synthetic as recited by the current claim, this should not have an effect on the final product produced since synthetic diamonds and natural diamonds are essentially identical (a diamond lattice crystal structure of carbon).

While Akaishi does not discloses a minute amount of non-diamond carbon in the body, it is assumed that since the process is essentially the same process as that of the current invention using the same materials that the same product would result, including a minute amount of non-diamond carbon. Akaishi discloses that the bodies had an average Vickers hardness above 70 GPa, which encompasses that currently claimed hardness.

Davies disclose a method of making a polycrystalline abrasive body, including a polycrystalline diamond body, by forming a compact of particles which are treated at high temperature and pressure to form the body. Specifically Davies disclose that the body may be made from diamond particles having a particle size as small as 0.1 μm (100 nm), and that this lower limit is imposed by the limitations of crushing, and not by the method of the invention (paragraph spanning pages 8-9). Davies further notes that in previous methods where a non-particle matter (i.e., sintering aid) is used it becomes difficult to leach out that matter as grain sizes and porosity decrease (page 1, 3rd paragraph). Davies discloses as a solution to this forming such a polycrystalline body

free of second phases such as sintering aids (page 2 last paragraph – page 3 first paragraph).

It would have been obvious to one skilled in the art, at the time of invention by applicant, to have modified the method of Akaishi by not using a sintering aid as taught by Davies. This would have been obvious because Davies discloses that such a process is possible, and removes the need to later leach the second phase out of the body.

Referring to claim 2, Akaishi, as discussed above, discloses a method of making polycrystalline diamond by enclosing diamond powder having a grain size of 0-0.5 μm (0-500 nm) in a Ta capsule which is then placed in a pressure transmitting medium (such as molten NaCl) and sintered at 7.7 GPa and 2200°C using a modified belt type apparatus (ultrahigh-pressure synthesizing apparatus).

However, Akaishi discloses the use of natural diamonds, instead of synthetic diamonds as recited in the current claims, and also uses a sintering aid.

Natural and synthetic diamonds are both known to those skilled in the art to be equivalents since they are the same material (a diamond lattice crystal structure of carbon). Therefore, it would have been obvious to one skilled in the art to substitute one known material for the other to achieve the predictable result of producing a diamond composite sintered body. *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982).

Davies disclose a method of making a polycrystalline abrasive body, including a polycrystalline diamond body, by forming a compact of particles which are treated at

high temperature and pressure to form the body. Specifically Davies disclose that the body may be made from diamond particles having a particle size as small as 0.1 μm (100 nm), and that this lower limit is imposed by the limitations of crushing, and not by the method of the invention (paragraph spanning pages 8-9). Davies further notes that in previous methods where a non-particle matter (i.e., sintering aid) is used it becomes difficult to leach out that matter as grain sizes and porosity decrease (page 1, 3rd paragraph). Davies discloses as a solution to this forming such a polycrystalline body free of second phases such as sintering aids (page 2 last paragraph – page 3 first paragraph).

It would have been obvious to one skilled in the art, at the time of invention by applicant, to have modified the method of Akaishi by not using a sintering aid as taught by Davies. This would have been obvious because Davies discloses that such a process is possible, and removes the need to later leach the second phase out of the body.

Response to Arguments

Applicant's arguments filed 2 November 2009 have been fully considered but they are not persuasive.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Specifically, Applicants arguments that the temperature and pressure conditions recited by Davies are outside of the currently claimed range is not found persuasive since that is not what Davies is relied upon for teaching. Davies is cited to show the known method of making a polycrystalline diamond body without the use of a sintering aid. The currently claimed heating temperature and pressure conditions in making such a body are shown as known in Akaishi.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RUSSELL J. KEMMERLE III whose telephone number is (571)272-6509. The examiner can normally be reached on Monday through Thursday, 7:00-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven P. Griffin/
Supervisory Patent Examiner, Art Unit 1791

/R. J. K./
Examiner, Art Unit 1791